



Closing the Loop: An Assessment of the Life Cycle of Beryllium-Containing Materials in the Department of Defense

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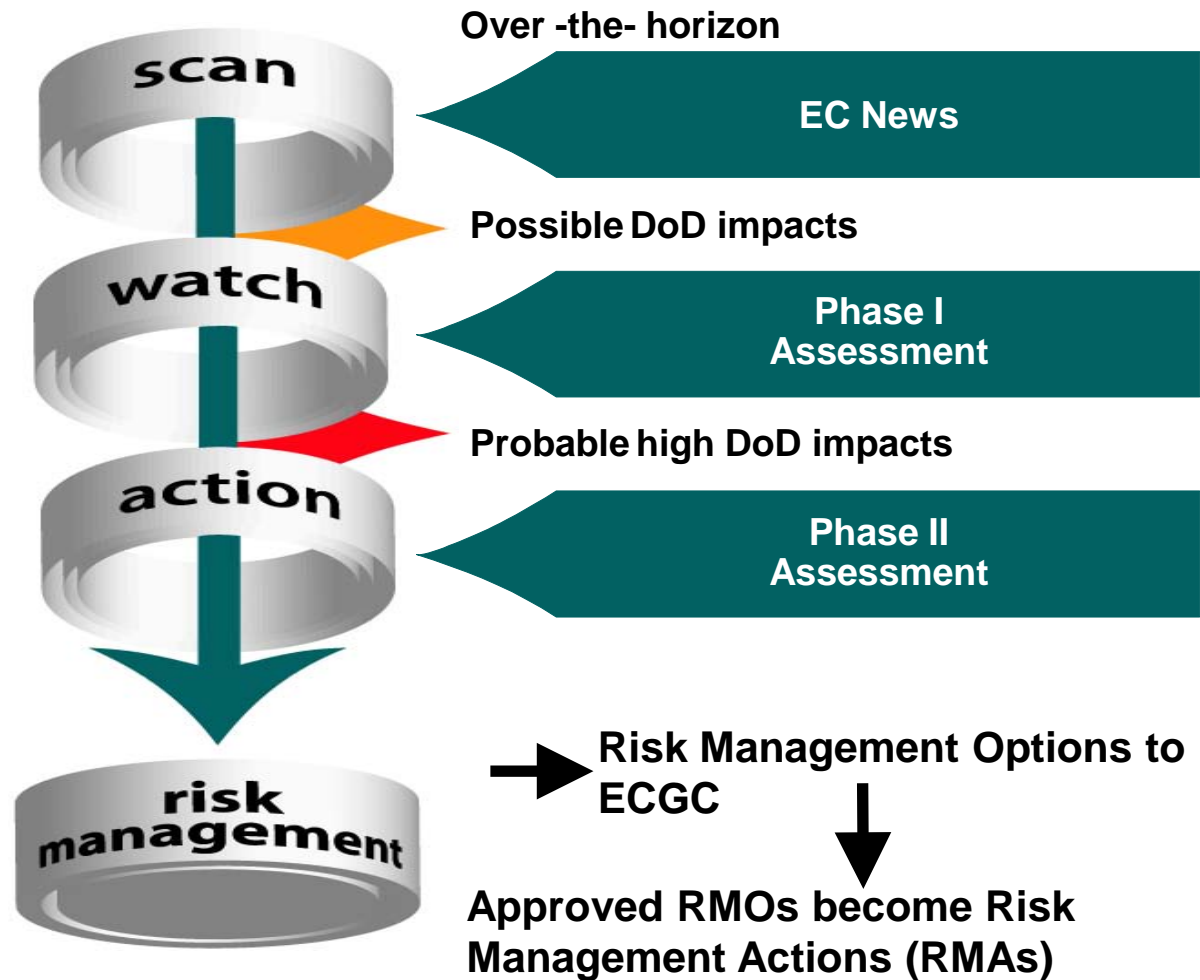
Today's Presentation Outline

- Background
- Purpose
- Study Design
- Findings
- Recommendations
- Next Steps

Chemical & Material Risk Management Directorate

- Purpose: To integrate science, technology, and policy to achieve a more sustainable future regarding the assessment, selection, and management of chemicals and materials within the DoD.
 - Facets: Acquisition ESOH, Chemical Management, Green Procurement, Emerging Contaminants (ECs)
- Goals: Proactively address future challenges; sustain the DoD mission; lower life cycle costs; drive innovation; avoid crises

DoD's Scan, Watch, Action Process for ECs



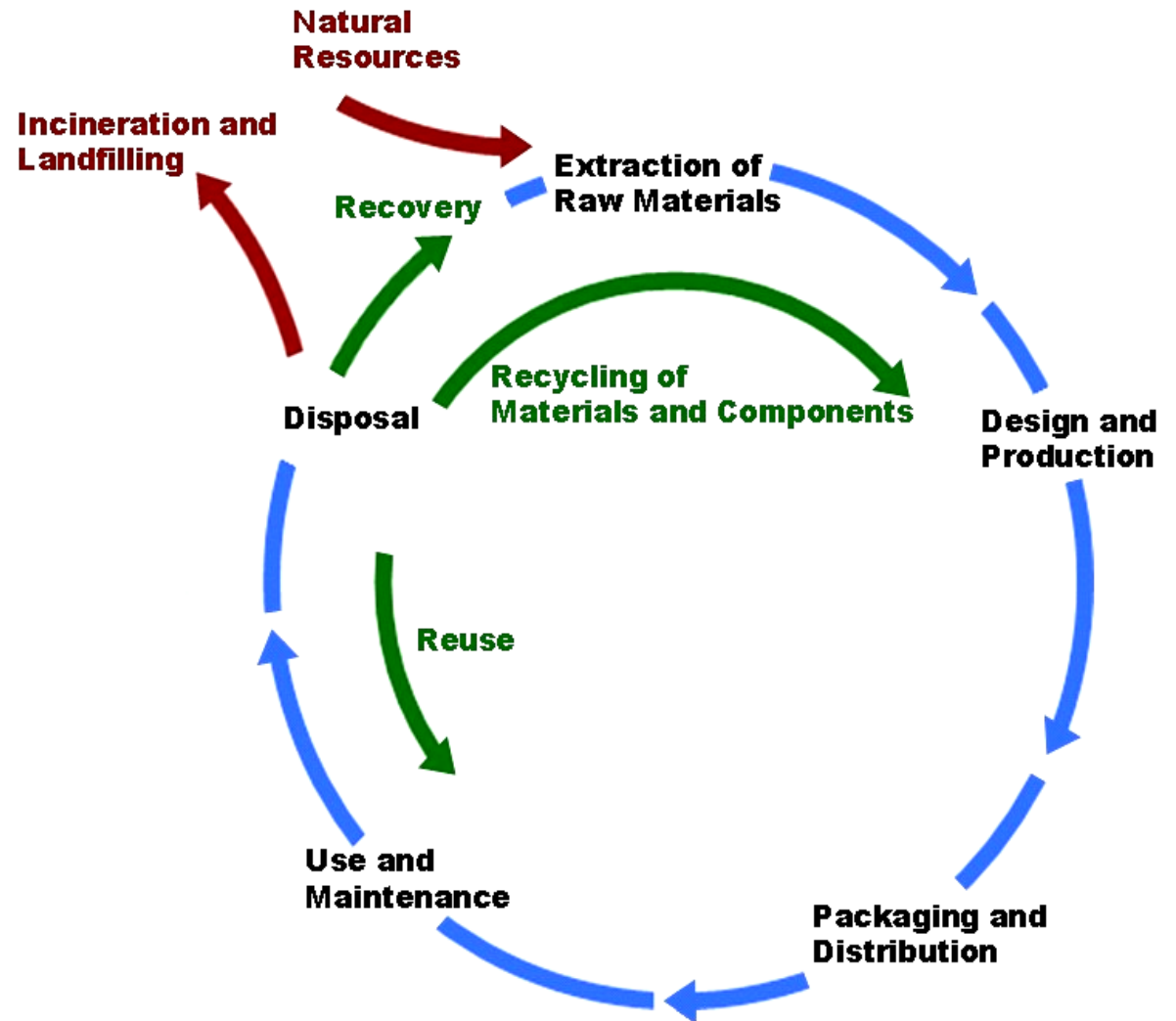
Beryllium as an EC

- Be is an Action List EC
 - Why? High risk of impacts to DoD resulting from changes in regulatory occupational exposure standards and limits
 - Impacts likely to ESOH, Readiness & Training, and O&M
 - Risk Management Options (RMOs) developed to address potential impacts

This Study

- Study Purpose
 - Address Be RMO #3
- Study Goals
 - Clarify and highlight gaps in **life cycle** knowledge by tracking DoD beryllium-containing materials through acquisition, purchase, use, maintenance, and end-of-life management
 - Recommend opportunities to close these gaps

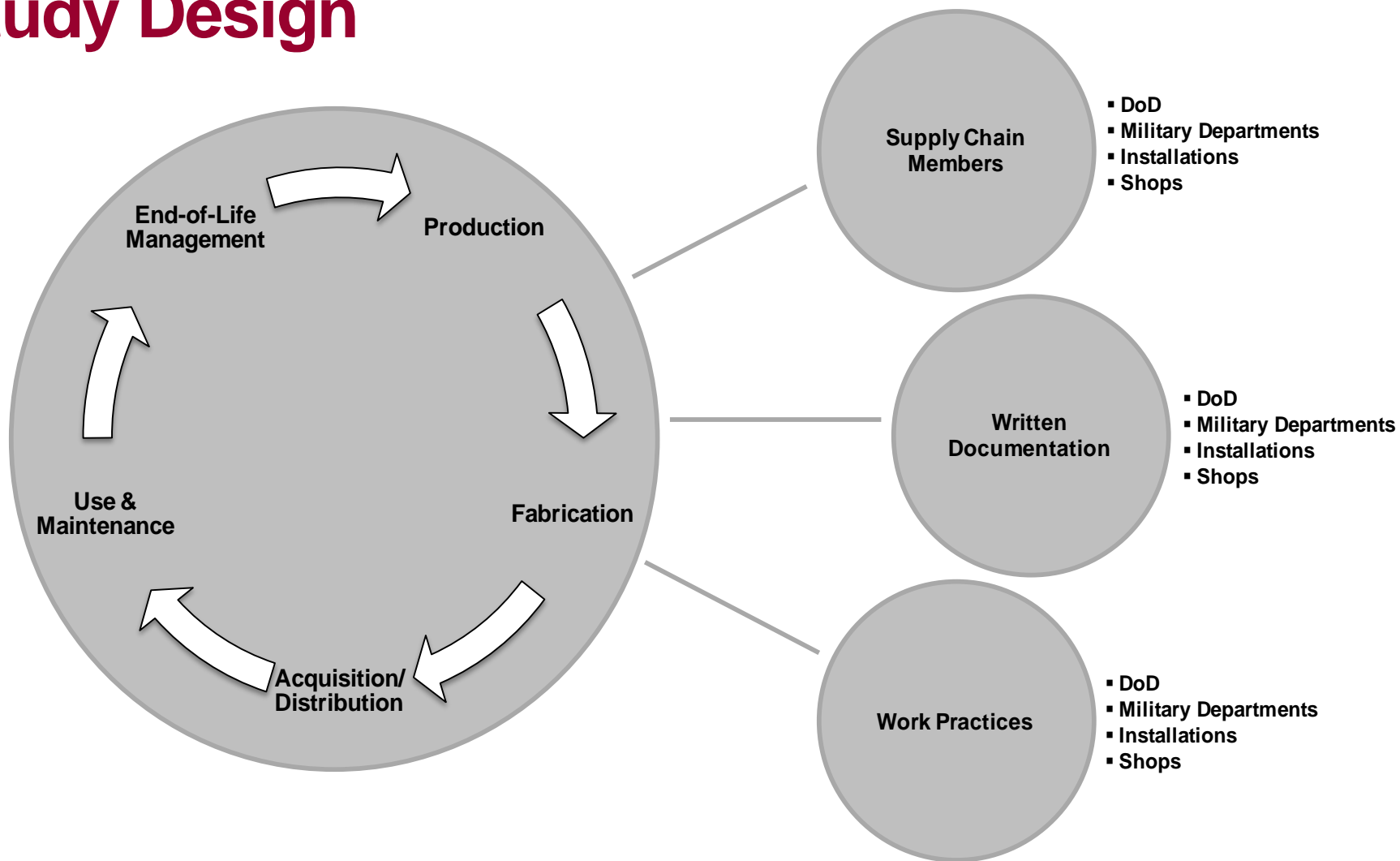
Life Cycle of a Product



Study Design

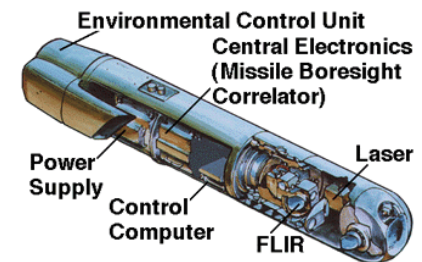
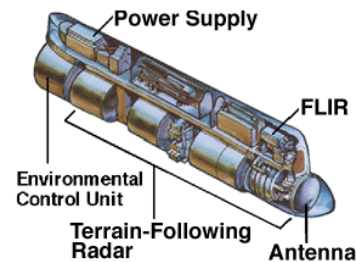
- Objectives:
 - Identify **supply chain members** who have role in DoD life cycle of Be-containing materials
 - Review **written documentation** concerning management of Be-containing materials at each life cycle stage
 - Conduct **case studies** that track select Be-containing materials used in DoD weapons systems and platforms through their DoD life cycle to **identify current practices** for Be-related activities

Study Design



Case Study

- Copper beryllium landing gear bushings
- Low altitude navigation and targeting infrared for night (LANTIRN) pod system



Findings

- Beryllium taxonomy is not comprehensive nor standardized

Category	Reference	Description
Strategic, Critical Material	Strategic Materials Protection Board Report, December 2008	High purity beryllium metal
	DoD 4160.21-M, Defense Materiel Disposition Manual	Beryllium metal, as billets, and beryllium copper master alloy, as ingots
High Temperature Alloy	DoD 4160.21-H, Defense Scrap Yard Handbook	High temperature alloy group 62: Beryllium
Critical Alloy	Air Force T.O. 00-25-113, Technical Manual, Conservation and Segregation of Critical Alloy and Precious Metal Bearing Parts and Scrap	Group No. 62, Beryllium, QQ-C-530, QQ-C-533

Findings

	Production	Fabrication	Acquisition	Use & Maintenance	End-of-Life Management
Supply Chain Members	✓	✓	✓	✓	✓
DoD Written Documentation as a Strategic/Critical Material	✓	✗	✗	✗	✓
DoD Written Documentation as a Hazardous Material	N/A	✓	✓	✓	✓
Practices	✓	±	±	±	✗

Findings

	Production	Fabrication	Acquisition	Use & Maintenance	End-of-Life Management
Supply Chain Members	✓	✓	✓	✓	✓

Findings

	Production	Fabrication	Acquisition	Use & Maintenance	End-of-Life Management
DoD Written Documentation as a Strategic/Critical Material	✓	✗	✗	✗	✓

Findings

	Production	Fabrication	Acquisition	Use & Maintenance	End-of-Life Management
DoD Written Documentation as a Hazardous Material	N/A	✓	✓	✓	✓

Findings

	Production	Fabrication	Acquisition	Use & Maintenance	End-of-Life Management
Practices	✓	±	±	±	✗

Recommendations

- Strategic Policy & Procedure Development
 - Clarify and standardize the beryllium taxonomy
 - Encourage a DoD-wide Precious Metals and Strategic Materials Recovery Program
 - Ensure existing installation- and shop-level materials management policies and procedures contain instructions for safe handling and recovery of Be
 - Ensure full utilization of existing Be recovery and recycling facilities (at OEM or BWI)

Recommendations

- Workforce Education & Training
 - Ensure personnel responsible for end-of-life management are trained to identify recoverable quantities of strategic, critical materials per existing written policies and procedures
 - Develop training to ensure supply chain members are aware of a new DoD-wide Precious Metals and Strategic Materials Recovery Program

Next Steps

- Review draft findings and publish draft report
- Finalize report and discuss recommendations with affected parties
- Present findings and recommendations to EC Steering Committee

Thank You

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